

# MACHINEGUN

*Magazine*

PREMIER ISSUE • SUMMER 2001 • 5\$ US



## EDITORIAL

### I LOVE TATTOOING, I REALLY DO...BUT I'M WORRIED...LAST TIME I CHECKED, TATTOOING WAS SUPPOSED TO BE FUN.

Sure, we're trying to do a good job and make money, but after twenty years of doing this, what I remember and care about most is the stuff that was fun. It used to be, the guys who weren't having fun were the ones who weren't too good at tattooing. It was like they were so worried somebody would figure out they were lousy tattooers that they'd meet all interaction head-on with negativity. Maybe the trouble with tattooing now is that nobody apprentices. A lot of scary guys don't want anybody to start tattooing, so nobody wants to be responsible for teaching—so people just don't learn. They tattoo, but they don't know much about being a tattooer, and they for sure don't know anything about the equipment.

Magazine will be how-to articles, from fundamentals like changing a capacitor, to advanced theory about frame geometry. If it's about tattoo machines and equipment, we're going to look at it. Hopefully you'll learn something, work on your equipment, tattoo better, make more money, and have some fun.

This is not going to be a magazine about tattoos. It will be a magazine about tattooing, and especially about tattoo machines. Our first project machine takes its name from the 1950's land-speed record setting jet car, the Green Monster. Our objective is to attain a speed of 300 Hz, which will make the Green Monster the world's fastest running tattoo machine. It's easy to make a machine run 150 Hz, but to double that, you must know how to maximize efficiency. What we learn from pushing the limits gets translated into

**...first of all we're going to try and have some fun, so if something seems funny, laugh at it.**

So this is how I propose to make things a little bit better...first of all we're going to try and have some fun, so if something seems funny, laugh at it. If something doesn't make sense...don't act like it does, ask somebody, ask a stupid question. Let's face it, if we were better educated, if we were smarter, we probably wouldn't be tattooing. So we're going to go over some pretty basic stuff. The main focus of Machinegun

controlling the machine precisely, making an everyday machine run exactly how you want it to. A lot of tattooers say that kind of stuff doesn't matter...if you think about it, those are the same guys who mostly are no fun, and are trying to make sure nobody notices that they don't know nothing.

If they can't dig this...they can't dig what tattooing has become. I for one, won't miss them.

Machinegun Magazine aims to become a forum for the exchange and discussion of ideas about tattooing and the equipment we tattoo with. Hopefully the classifieds will bring some of that old equipment out of trunks and boxes, and off to new homes, and a hot-rodded, souped-up second chance to get to work. Your response to the magazine will determine how often we put out an issue. Write to us, let us know you're out there. "Letters to the Editor" will be a section that allows readers to express their views on past articles or issues, future content or the magazine in general. Machinegun Magazine reserves the right to publish, edit, reformat, accept or reject all letters received. Any letter received which is considered offensive or inappropriate in any way may be refused for publication. All letters to the Editor must be accompanied by the authors' full name, city, state, and telephone number. Names will be withheld on request.

#### TATTOOING IS DONE WITH A...

- ☐ machine
- ☐ gun
- ☐ all of the above

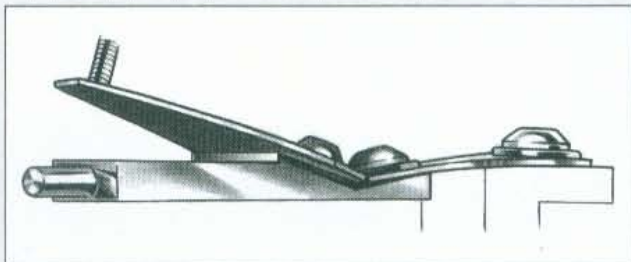




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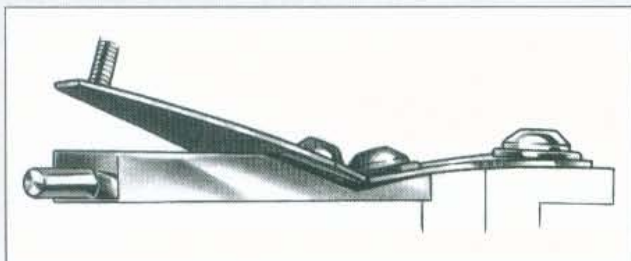
THERE ARE TWO KINDS OF PEOPLE IN THE WORLD...TATTOO ARTISTS AND LOSERS WHO WISH THEY WERE TATTOO ARTISTS.

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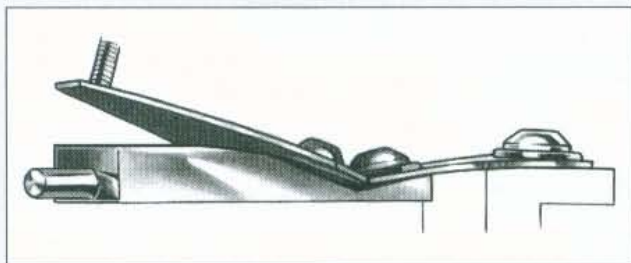
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# The GREEN MONSTER

## THE PLANNING STAGES OF BUILDING THE WORLD'S FASTEST TATTOO MACHINE.

The most important measurement that can be made on a machine is the speed that it runs at. Machine speed determines if a machine will work as a liner or a shader. Most tattooers have no idea what speed their machines run at. Some are using a liner for a shader, and some are trying to outline with a machine that should be a shader. They could easily fix this, if they could measure and control the speed of their machines. Speeds of 100 to 120 Hz are common for shaders, and speeds as high as 150 Hz are used for liners. The Green Monster will break the 300 Hz barrier. We're not building this machine just to go fast. By making it run at maximum speed, we will learn what the limitations of each part of the machine are. Once we know that, we can figure out how to overcome those limitations, and engineer a better running machine.

The old adage dime gap for a liner, nickel gap for a shader implies that to adjust speed, you should adjust the point gap. Adjusting point gap is the least efficient way of adjusting machine speed. It will change the sound of the machine a lot, but not the speed.

Consider this, if you can tattoo into the permanent layer of skin with the short stroke length of a liner, why do you need a longer stroke length on a shader? Shaders have a longer stroke length to slow the machine

*Consider this, if you can tattoo into the permanent layer of skin with the short stroke length of a liner, why do you need a longer stroke length on a shader?*

down. A long stroke length is difficult to tattoo with, and there is the potential of tattooing too deeply into the skin. Length of stroke is very important, and should be established during the planning stages of building a machine. Most people are running an armature bar that's too heavy in their liner. To compensate for that they have to run overly hard springs, the end result being they need lots of voltage. They also generally run an armature bar that is too light in their shader. They compensate for that with soft springs and a big air gap, the end result again being they need lots of voltage. Speed should never be attained by running an overly long or short stroke length. To tattoo, you need

### FYI

**In the late 1950's, Walt Arfons came up with the idea of building a car powered by a military surplus jet engine. In 1960 his jet car, The Green Monster, ran 342 mph at Bonneville. The Green Monster also set records for 1/4 mile top speed from a standing start in 1961 and 1963.**

a working stroke length of at least 1/16 of an inch. You can lock down that stroke length, and still get a machine to run any speed you want, even 300 Hz.

The most efficient way to increase speed is to lighten the armature bar. To increase the speed even more, we will have to reduce the point gap and the air gap on the machine to the minimum. The problem is, reducing the air gap will leave us with a stroke length that is too short. We're going to build a custom frame that will set the tube vise approximately 1/2 inch forward of stock (see diagram below). This extension of the frame base will give the machine maximum stroke length with a minimal air gap. We will balance the short air gap with a short point gap. The front spring will be super hard, and will be balanced with high back spring pressure. Those factors will create maximum speed with a proper working stroke length. We're going to make two frames, one of aluminum, and one of brass. Comparing

the two should answer some questions about frame material. Usually when guys work on machines, there's no planning...but a little forethought will go a long way.

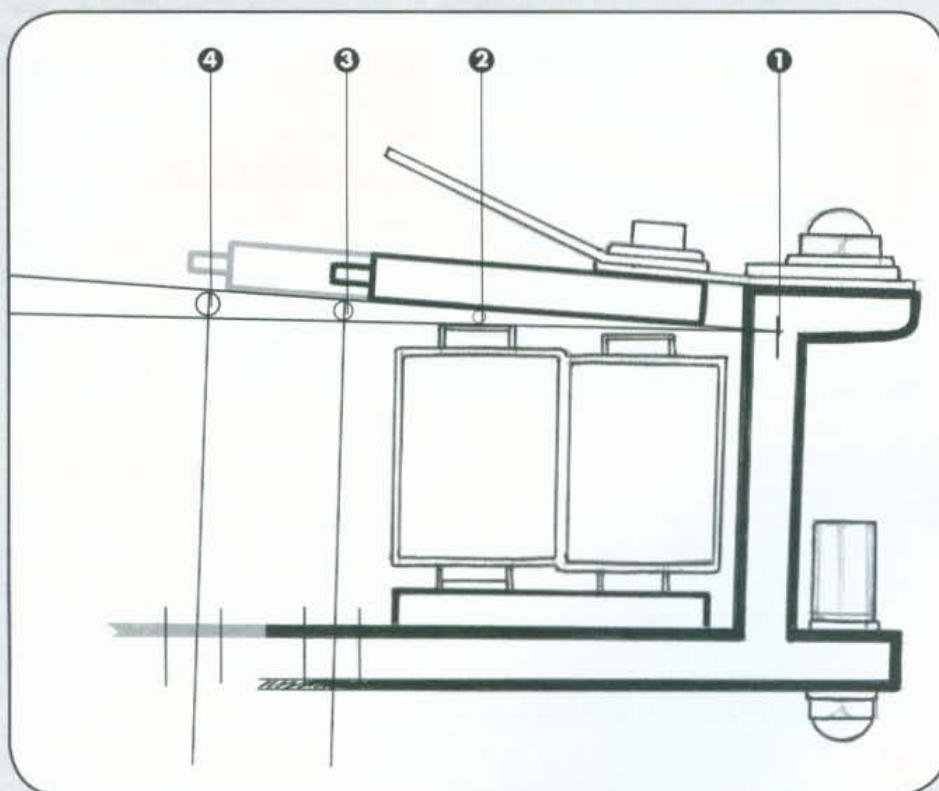
### IN THE NEXT ISSUE

We're going to get to work building this thing, comparing the frame materials, trying different capacitors, (remember we'll be running at 300 Hz) and cutting springs for the monster. We'll be installing a custom armature bar that's not only light, but it will mount the front spring at a much higher angle than usual. We'll discuss how this affects the follow through of the contact points, and what follow through is and how it affects your machine.

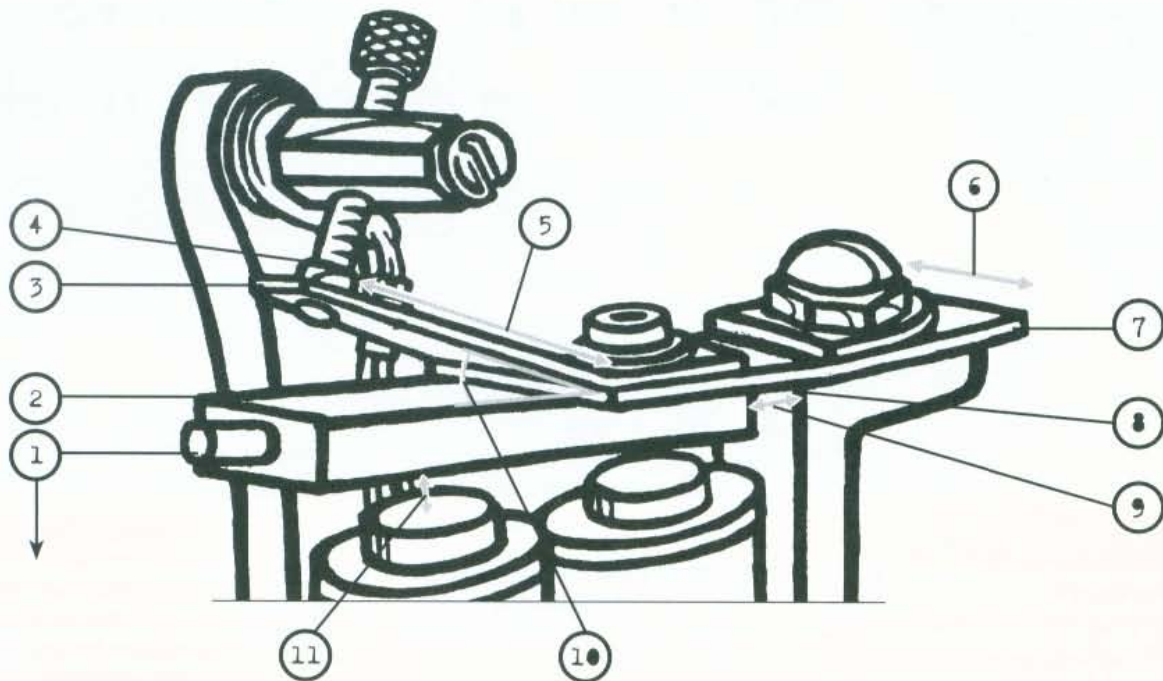
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***As distances increase from the fulcrum point, length of working stroke increases while size of air gap remains the same.***

1. the fulcrum point
2. the size of the air gap
3. length of working stroke with conventional placement of tube vise
4. length of working stroke with tube vise moved forward on extended frame



# Machine Measurements



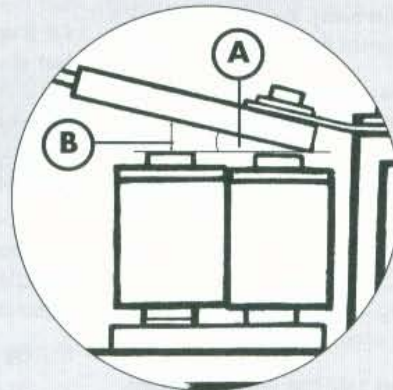
## PHYSICAL MEASUREMENTS

1. back spring pressure
2. weight of armature bar
3. front spring gauge
4. point gap
5. front spring length
6. back spring width
7. back spring gauge
8. back spring angle of deflection  
(see diagram to right)
9. back spring length
10. front spring angle of deflection
11. air gap

## ELECTRONIC MEASUREMENTS

speed  
duty cycle  
follow through  
voltage

## 8. Back Spring Angle of Deflection



Back spring angle of deflection must be measured **without** front spring on machine.

Angle of deflection may be measured

**A.** as an angle in relation to machine frame

**B.** or as a distance between centre of front coil and armature

Once front spring is mounted on armature, the measurement between front coil core and armature is the **air gap**.

# SETH CIFERRI DISCUSSES MACHINES AND BEING A TATTOOER

IN THIS MARCH 2001 INTERVIEW WITH BILL BAKER

**Bill Baker:** What's the deal with O-rings? I'm going to tell you right off the bat – I can't stand it.

**Seth Ciferri:** It makes the machine sound better. Like, it's a quick fix to make it sound good, but you've got to bump your volts up by at least two or three. I say take them off and throw them away. You know, I think a lot of it comes from Mickey Sharpz.

**BB:** He was a product of that time. How many machines do you think he's made?

**SC:** Well, let me think. I've bought three or four machines from him, a while ago. One was #141, one was #86, and one was like five-something...and now the Microdials are up to around 3500.

**BB:** If a guy sold that many machines, made that much money, why didn't any of it go back into research, why didn't any of it go into a better machine?

**SC:** Exactly.

**BB:** I believe an awful lot of how tattoos look, or whether a tattoo is done well, is machine related. You cannot tattoo good with a crappy running machine.

**SC:** You know what, I think you can. You could do a tattoo with a shitty machine.

**BB:** Yeah, I could compensate for it right, left and centre – but I think there's things I can accomplish with a better machine.

**SC:** If you take each of the variables that exist step by step, I think that you have no choice but to do better tattoos.

**BB:** I agree – and I think that you can't just give somebody a machine, and say this is a great running machine for everyone. But that's kind of how I was taught. I didn't even know these variables existed.

**SC:** I know, the guy I worked for used a pair of Spaulding Supremes...both exactly the same. The only difference was nickel shader – dime liner.

**BB:** Oh golly, here we go with this.

**SC:** Well, you know – that was it, one went eeeeeeee, the other was uhh hhh unghhh hh hh, and they were both running on those Spaulding toaster boxes.

**BB:** Yeah, those are amazing.

**SC:** Putting out about 30 volts.

**BB:** Yeah, I'd like to run about twelve rubber bands on that machine, please. Because on zero that thing is putting out eight volts.

**SC:** That's what I'm talking about!

**BB:** I want to talk about the names of the parts on a tattoo machine. We all know what we're talking about, but we have to go through a lot of effort to describe it to each other. The back spring shelf is where you bolt the back spring onto the frame. But I've always called that the spring saddle. Is it the spring saddle?

**SC:** I would know what you're talking about.

**BB:** Would you?

**SC:** Yeah.

**BB:** Some guys don't – I wish we just had one term that we all used.

**SC:** Right – like a universal word.

**BB:** I think there is starting to be a need for this language. When guys would get together once a year at a convention, and have their machines in the pocket of their jeans, and take them out and go...look at what I'm doing...they'd point to parts, or they would write a letter, and draw a little diagram, and say, see, I'm doing this and I'm doing that. But on the internet, it's completely language, and I think it's difficult to explain to somebody, even talking to them – just with language – what part of the machine you're talking about – or how that machine is running.

in the site, people check out the information on the shop.

**BB** It seems like it's manageable right now, but we're talking about something that's only been going on for a few months—what are you going to do?

**SC** I think what's going to happen eventually is I'll probably get on there two or three times a week and the other guys who are really into it, and involved with it the most are going to keep it going.

**BB** I think that the website probably adds a whole other cast of characters to everyday life in the shop. I'm sure that there's some talk in the shop about what so and so said last night.

**SC** It's definitely a topic of discussion around here. The forum's been a big thing for us, and it's been a lot of fun.

**BB** How long has the shop been open?

**SC** I opened it in July of '99. I was at Little Vinnie's for two and a half years. Before that, I had been in a shop in D.C. called Jinx-Proof, we opened that place in September of '96. I stayed there for nine months. It was a seventy-five mile commute from where I lived. I did that five days a week and was done. I was moving anyway and Vinnie had just opened up his new shop, which was six miles from my new house—so I went to work for Vinnie. Stayed there for two and a half years, and just got restless with dealing with the steady flow of walk-in customers. Well, you know how it is...they're trying to run a tight ship, and trying to do things their way.

**BB** And you've got ideas—that are yours—I'm sure that was part of the motivation of you getting your own place going.

**SC** Pretty much. Really, every shop I've worked in, every single shop I've worked in I've always had something to say about how things were run. I'm that kind of person.

**BB** Yeah, I can see it.

**SC** Like, it always upset people, and I always understood why. You know, if I can't keep my mouth shut, what am I going to do?

**BB** Well, open your own shop,

**goddammit.**

**SC** Exactly, they'd say if you don't like it, go open your own place. And now I've got my own place and I'm fuckin' scared to death.

**BB** The shop looks really cool. I'm sure you've been getting lots of good response.

**SC** Yeah, when I first got the place, I had one station in the back, reception area up front, and some framed old flash. But I missed working with my friends. Matt Rinks is here full-time now, and Nancy takes care of the walk-ins, it's cool, everybody here gets along really good.

**BB** Right, and there's stuff happening, but you can't tattoo every single person who wants to get tattooed by you, and build machines everyday, and handle the website, and everything else, right? Which are all good problems to have...but...

**SC** Well, what I've tried to hash out for myself is starting next week I'm tattooing three days a week and that's it. Whether I'm in the shop or not. That's a whole other story. So three days of appointments, and at least two days of machine building.

**BB** O.K. 'cause I was going to ask would you even consider letting the machine building drop? I would hope not.

**SC** No, probably not, because I really think I've got something that's going to do good for people, that's really going to make people's jobs easier.

**BB** I agree with you. When did you actually start taking this stuff apart?

**SC** As soon as I started tattooing. When I was probably about fifteen, when I first got tattooed, I guess, maybe a little bit before that, a friend from high school and myself kind of rigged up a little cassette motor deal, and of course, marked each other up a little bit with some stupid little shit, and it was just kind of one of those things where I'd bring kids home from school and mark them up every now and then. Right around the same time my brother, Adam, ordered some stuff from Spaulding and Rogers, and he was marking up some kids too. It got to the point where when he was at

his day job, which was being a brick layer, I'd come home from school early and 'jack his stuff and try and put something on somebody before he came home from work.

**BB** 'Cause he'd have the high powered Spaulding set-up, which means you could really do some tattooing then.

**SC** Adam got an apprenticeship with the same guy I later did. Close to a year, maybe eight months before I got there.

**BB** How long did he stay there?

**SC** He was there for about a year and a half.

**BB** Well that's a pretty long time...for that kind of environment...

**SC** Yeah, it was pretty scary. It was definitely a lot of crazy biker stuff, you know.

**BB** Yeah, and there's a lot of unwritten code of the hills, or kind of code of ethics stuff that doesn't really make any sense. And it's kind of hard, especially being a punk-rock kid, to go 'you know what? I just don't buy into any of this crap.'

**SC** Right.

**BB** But you have to...and you don't know no better, and it's tattooing, and you're over-whelmed...So eventually you got mixed up there, too, and then you got better equipment, obviously.

**SC** The first machine I was handed and told 'use this thing', was a Paul Rogers, Mad Bee. And sure as shit the first thing I did was tear it apart and break the wires in the centers of the coils, you know.

**BB** Good thinking.

**SC** First thing...so there's me trying to solder up into the core. I seriously tried to do whatever I could to put this thing back into working order so I could put it back in the box and pretend I didn't touch it. So I was given some stuff to use, it was obviously his and I wasn't to take it with me. While I was working there, I met a guy named T. Swartz, he was tattooing out of his house, and he gave me a couple of machine frames and a couple of pairs of coils and gave me some tips, as far as not fucking things up. Pretty basic stuff. He showed me how to make needles. When I was working at

SC Right – exactly.

BB I think it just doesn't exist – maybe we should just start pushing it.

SC Right.

BB And tell guys – we want to call it this and we want to call it that.

SC Yeah, it's definitely interesting. It's something that I've thought about. Because people don't know what you're talking about. When you say yoke to some one, they think you're talking about a tube vise.

BB This whole language thing is really a big deal to me. As far as your website goes, is the machine discussion area your whole site? Or is it part of your site?

SC That's just part of the site. The whole site went up at the same time. The first forum that went up was real simple, there wasn't a really good structure to it. It was real loose you couldn't read the post easily, you really had to search through them. We changed over to the new one on December 28.

BB Right around New Year, 2001.

SC Yeah.

BB So that's only three months ago.

SC Yeah, and that one has gotten, as of today, close to 36,000 hits.

BB That's good. I know on the internet anybody can have an opinion. It's like a soap box they all can stand up on, one at a time, and say whatever they want – somebody is in charge, a little bit like a ring master of the whole ordeal – and I assume that's you, right?

SC Well, the only kind of position I have, in that sense, is making sure that stuff doesn't get out of hand. I really try and encourage people to bring up certain topics.

BB Do you have a topic that you post for them to respond to? Or do you just let it develop?

SC I think it's a little of everything. A lot of the topics that I post are just everyday shop stuff. Stuff that I think is funny. A lot of times somebody will post a technical question like 'why should I not

use grommets?' for example. That one got so much attention. What helps a lot is Aaron comes on, and he'll break stuff down for people. People have a lot of respect for him.

BB Yeah it's true.

SC So when he says this is what I use, and this is why, and explains it step by step. You wouldn't believe how many people are like, 'Oh my God, I changed over to using paper towels now instead of grommets and my tattooing is so much better'. It's unbelievable to see.

BB I think the Internet is a better venue for apprenticeship than any other form of it ever could be.

SC You think?

BB Yeah, I really do. It's kind of crazy, but you can put a question out, and you know there's a little bit of being anonymous, so you can ask a real dumb question without feeling too bad.

SC And you're getting all that input from so many different angles. Somebody can really get a good objective response from everybody. Not just from some cranky old biker who's doing it his way.

BB And even if he's right ninety percent of the time, he's still wrong ten percent of the time. And even his ninety percent that's right – isn't the only way.

SC Exactly.

BB So I think it's really an amazing thing. If somebody wants to get on your site... they've got to be registered...right?

SC To actually post. Anybody can get on and read the posts.

BB Yeah, which I've done.

SC Right, all you have to do to register is click register or log in, you'll pick a screen name and a password, then you hit enter. It sends you an e-mail to confirm, you respond to the e-mail and that activates your account. That's all it is, really, just registering.

BB Does it cost anything?

SC It doesn't cost anything to register – it's a totally free thing. I just do it because it's fun. It generates a lot of interest

**Right, all you have to do to register is click register or log in, you'll pick a screen name and a password, then you hit enter.**

the shop we used pre-mades so when he came along he was like 'what are you doing?! You gotta build your own needles, you gotta make mags' – he kind of set me straight, in that regard. Then I left there, and went, well, I tattooed out of my apartment. A lot of the early inspiration for putting machines together came from Tom Beasley.

**BB Yeah, he just had that thing about tinkering – and working with machines.**

**SC** Right, my brother worked for him for a while, and while my brother was there, I'd go to the shop. When I was tattooing out of my apartment, they let me use their autoclave—while I was waiting for the 'clave to run I sure as hell wasn't sittin' on my hands—I was digging through his shit, you know, and I went and got tattooed by him – and watched intently every little thing that he did. He spent a lot of time with Paul Rogers, and picked up a lot of stuff—not that Paul Rogers is the end-all, but I think he was one of the first guys that really started to delve into the real function of the machine. And I think it's going the direction he would have wanted it to go.

**BB It's funny, people really romanticize this whole old-school thing.**

**SC** It's like all these guys that are just so stuck on doing traditional tattoos—and you would think that they're trying to stay true to whatever—but Sailor Jerry, for example, was all about moving forward, and progressing. These people are just trying to replicate what he was doing in 1965.

**BB Or their perception of what he was doing in 1965...if he was them.**

**SC** It's not doing him or them any justice – it's really going against what all that was about I think what Aaron is doing is way more along the lines of what these guys would have expected.

**BB Yeah, they were just doing whatever they could do.**

**SC** There was a reason these guys weren't using hot pink pigment. It was because they didn't have it. So, what happened

when I left the first shop... the guy took all my equipment that I had managed to get. I had bought a couple of machines and a bunch of tubes. He knew he was getting rid of me, but I didn't know he knew I had some money saved, and it was like, 'hey, you need to get your own place, you need to get a new car, you need to buy this equipment'...so he completely made me exhaust all my savings...and then fired me, changed the locks on the shop, and kept all my stuff.

**BB It's amazing how they do it. And it's so lame, it's just the same, all the time.**

**SC** Yeah, some old school shit. I got lucky and my friend Pee Wee, who also apprenticed at the same place—he had left already—he went to go work at Dragon Moon, with my brother. He gave me a couple of Philadelphia Eddie's machines. Some of the early United stuff, the real shorty machines— he gave me a couple of those to use, and a power supply. Mick Beasley set me up with a job at Tattoos by Lou in Miami. I drove down to South Beach, and Lou took a look at the machines and was like, 'what the?? What're you doin? Let me re-spring these.' I was, what do you mean re-spring them?

**BB Like what are you talking about?**

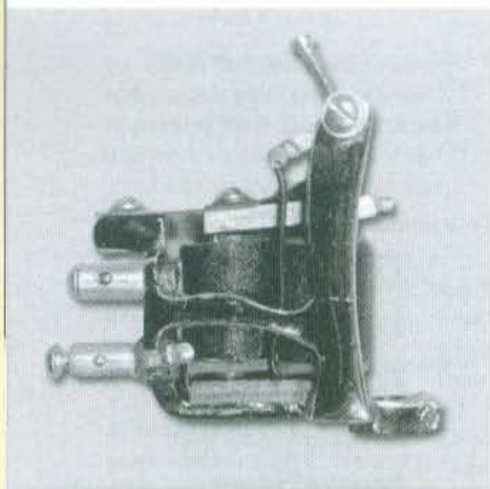
**SC** So he comes back the next day, and he gives me my machines...and they each have two front springs on them, of like real thin, like .13 gauge stock. One was a little shorter than the other, you know what I'm talking about?

**BB Yeah I know.**

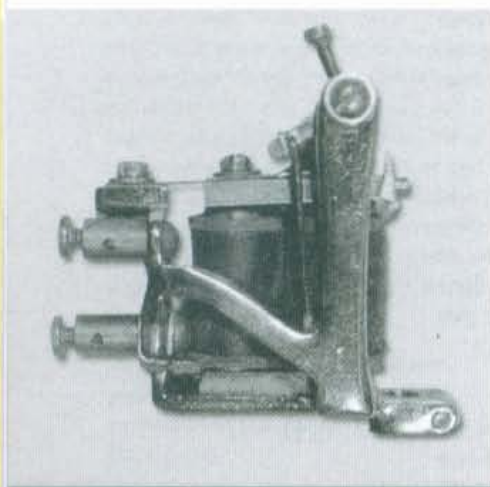
**SC** And I thought they ran like crap. I couldn't believe what he handed me back. But it was my first exposure to somebody not using O-rings. So that was that. I couldn't hang in Miami—I stayed there for like ten days and came right back to Baltimore. Then I drove up to New York to try and get a job with Bruce Bart, up in Hunter Mountain. That didn't work out, it was just too far, I didn't want to be away from Baltimore. So I came back and got a job in a total ghetto shop.

**BB What year are we talking about now?**

**A lot of the early inspiration for putting machines together came from Tom Beasley.**



**Jonesy Roundback**



**Jonesy Squareback**

**SC** March of '95. I stayed there until September of '96. While I was there, this guy, Danny Dringenberg had just started making coils and stuff. I managed to get a hold of a couple of pairs of his coils. Somewhere along the line, I'd gotten a couple of National Deluxe frames, and I put them together with his coils. Gradually I figured out that I could buy equipment to cut and punch my own springs, and I bought a roll of feeler gauge stock and started putting these Jonesy frames together. Matt Rinks and Brady Duncan got some from me, and Tim Hoyer bought one from me a long time ago. People that I knew were getting them from me. The only real difference that I was doing between liner and shader was I'd bend the front spring up higher to make it a liner, and make it a little stiffer. When I was selling these things I showed one to Mike Malone, and he's like 'what is this?' You know, it could have been either a liner or shader. Kind of middle of the road. So...back to the drawing board. So I called him up and he's like 'Look, I'm going to lay it out for you.' So he tells me, like look, this is the difference. This is why a shader runs the way it does, and he got into how thick the pigment is, compared to regular black outline pigment, and the speedier outliner is that way for a reason. Your shader has to be slow and punchy to push that pigment because the pigment can't keep up with the needles if they're going too fast, and you're making all that blood, and all those holes, and no pigment is going in. So then it was like, O.K. how do I make it go slower? It was an obvious thing— increase the distance between the armature bar and the spring shelf. Make a longer front spring that has a little more give to it...and it seemed really obvious to me.

**BB** Were you altering the aesthetic of the frames – did that even enter your consciousness, did you even care?

**SC** Well, when I got those brass National frames, they're a bit square...I was taking them to a belt sander, and I was grinding off all the hard edges, making it look like a round-back. Filing the shit out of them—I'd buff 'em real nice, sometimes putting some patina chemical on there, and engraving my name real fancy on them.

**BB** See, well that's good...there was some of that going on, too. Not just mechanical.

**SC** Right, it was probably more aesthetic than mechanical. I guess one of the main things I was doing, only because I had seen it on Paul Rogers machines, was I had some base plates made with the tube crusher collet, and I was cutting the chuck off the Jonesys.

**BB** Right out of the box—brand new?

**SC** Yep. Nothing wrong with them, no repair needed – just cut it off. It was because I was trying to replicate the Paul Rogers machines that I'd seen.

**BB** But it's a pretty big change to whack off part of the frame, it really is.

**SC** Yeah, and most kids my age who were not in tattooing all that long hadn't seen that much. They were using a right out of the box Dennis Dwyer machine or a Spaulding machine or something like that. Danny's coils were really neat, they had that cool c-clip thing on top holding the washers on there—those machines were kind of gimmicky you know.

**BB** But that's O.K. because a lot of that is aesthetic, and guys would think, 'wow this looks cool.'

**SC** Right, they don't have to use that chrome machine with the Spaulding-sparkly blue coils with the tiny, tiny little capacitor.

**BB** Do you sometimes now think you'd like to make a machine that's different, or have you just got a style in mind, and you like how it looks.

**SC** Well, the frames that I had cast are the same design as the Johnny Walker frame, which ended up being the Spaulding Supreme—it's the same frame, without the hole in the side. It's a lot thicker, a lot heavier frame, and it's made of iron, I've got some brass ones, too.

**BB** It would be about the same size, then as the ones Mickey Sharpz and Mickey B were making. The same basic frame style, a little bigger than the Supreme.

**SC** Actually pretty much the same size as the Supreme and pretty much the same geometry. I really wanted some of the older castings when I did the first run, but those old castings were impossible to get. I only did a few of them because I wanted some for myself, and for my friends. More and more people kept asking for them, and now I'm up to my elbows in it.

**BB** And once again, it's like no matter which direction you turn, you just end up where the trade seems to think it wants you.

**SC** Exactly—the thing with the machines is I don't advertise them—I mean—I've got my little thing on the web, but I don't do any magazine advertising with it. I want them to be available, but I don't want them to be in everyone's face.

**BB** When you set out to cast the frame, you went to an original basic design. There are a number of frames in tattooing that have been around since the beginning. I don't think many guys know about them, which is kind of a shame. What would you say would be the four or five most important frames?

**SC** Oh man...the Jonesy, the Johnny Walker. Ernie Carafa did a frame, somebody told me it was a Waters design...real square, upright leans back slightly, and there's a slot at the top of the upright—so there's a little distance for the top binding post to move. This frame was particularly a pain in the ass because the rubber bands didn't make contact with the needle bar unless you routed them behind the upright.

**BB** It's a Guideline machine, sold through Guideline like in '82 or 81?

**SC** The Bulldog I think was important because it was one of the first frames that was made specifically to be this design

for this purpose. And I think there have been very few frames that were just for a specific thing—I think that was definitely a technical pivotal point.

**BB** So that gives us four. These are all mechanical things—could you tell me what do you think is the most beautiful frame ever, just to look at? ...You could tell me a car, I'm sure.

**SC** '32 Ford—what is the '32 Ford of frames? I don't know.

**BB** I want to know.

**SC** Those Paul Rogers, the V frames.

**BB** Does it go on your list then?

**SC** Yeah, the thing is, though, I think that that's another one of those frames that's middle of the road. I don't think that frame had a specific function in mind.

**BB** Can you take that V frame and fix it?

**SC** Yeah.

**BB** The problem isn't just the frame, it's the armature that's in it.

**SC** Exactly. That's the thing where I've been compensating. At this point with the machines I have to figure out what I'm going to do. One of the things that I'm really concerned with is making the machines available, but at the same time making them really good. Like look at the Sharpz scenario, the more he makes, the worse they are...and I don't want to get to that point—I want people to always be able to get good ones from me.

**BB** What if somebody came to you, and said—'Seth, don't be stupid—you could make a lot of money, all you have to do is give me the rights to this, I'll set up the little factory—we'll knock out thousands of these things—we'll run full page ads—we'll be rich.'

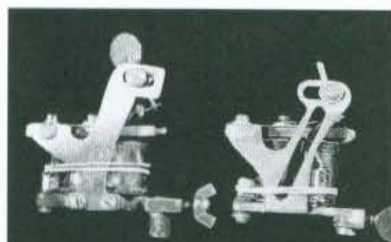
**SC** Fuck that. I'd never do that.



**Seth Ciferri, Custom Machine**

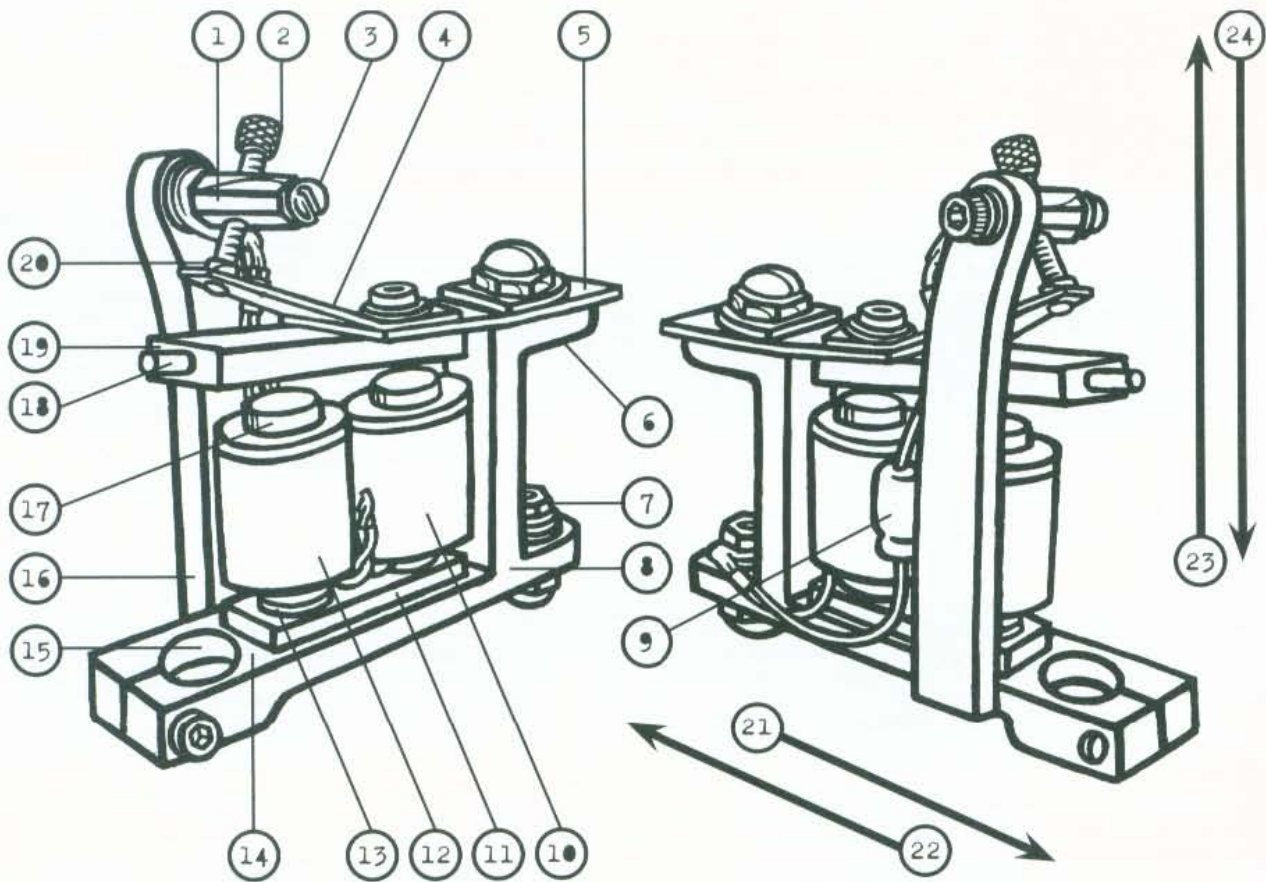


**Seth Ciferri, Custom Machine**



**Paul Rogers V Frames**

# Machine Parts



|         |          |          |
|---------|----------|----------|
| 1 _____ | 9 _____  | 17 _____ |
| 2 _____ | 10 _____ | 18 _____ |
| 3 _____ | 11 _____ | 19 _____ |
| 4 _____ | 12 _____ | 20 _____ |
| 5 _____ | 13 _____ | 21 _____ |
| 6 _____ | 14 _____ | 22 _____ |
| 7 _____ | 15 _____ | 23 _____ |
| 8 _____ | 16 _____ | 24 _____ |

DATE:

NAME:

An important part of discussion is the ability to understand one another. In an attempt to get us speaking the same language, please fill in the blanks, identifying the various parts of the tattoo machine, using the words you usually use to identify them. Remember, there is no right or wrong answer. When you are done, please fax to 613.384.9583, mail to 692 McKay St. Kingston, Ontario, Canada K7M 7G2 or email [info@machinegunmagazine.com](mailto:info@machinegunmagazine.com).

DATE: **APRIL 2001**

NAME: **BILL BAKER**

- ① TOP BINDING POST
- ② CONTACT SCREW
- ③ SET SCREW
- ④ FRONT SPRING
- ⑤ BACK SPRING
- ⑥ SPRING SADDLE
- ⑦ BACK BINDING POST
- ⑧ FRAME
- ⑨ CAPACITOR
- ⑩ BACK COIL
- ⑪ YOKE
- ⑫ FRONT COIL
- ⑬ COIL SHIM
- ⑭ FRAME BASE
- ⑮ TUBE VISE
- ⑯ FRAME UPRIGHT
- ⑰ COIL CORE
- ⑱ ARMATURE PIN
- ⑲ ARMATURE BAR
- ⑳ CONTACT POINT
- ㉑ FORWARD
- ㉒ BACK
- ㉓ UP
- ㉔ DOWN

DATE: **4/21/01**

NAME: **SETH B. CIFERRI**

- ① FRONT BINDING POST
- ② CONTACT SCREW
- ③ SET SCREW
- ④ FRONT SPRING
- ⑤ BACK SPRING
- ⑥ SPRING SHELF
- ⑦ REAR BINDING POST
- ⑧ FRAME
- ⑨ CAPACITOR
- ⑩ BACK COIL
- ⑪ YOKE
- ⑫ FRONT COIL
- ⑬ COIL SHIM
- ⑭ COIL SHELF
- ⑮ TUBE VISE
- ⑯ UPRIGHT (FRAME)
- ⑰ COIL CORE
- ⑱ NIPPLE
- ⑲ ARMATURE BAR
- ⑳ CONTACT POINT
- ㉑ FORWARD
- ㉒ BACK
- ㉓ UP
- ㉔ DOWN

DATE: **MAY 2001**

NAME: **CHUCK ELDRIDGE**

- ① TOP BINDING POST
- ② CONTACT SCREW
- ③ SET SCREW
- ④ FRONT SPRING
- ⑤ BACK SPRING
- ⑥ SPRING MOUNT
- ⑦ BACK BINDING POST
- ⑧ FRAME
- ⑨ CAPACITOR
- ⑩ BACK COIL
- ⑪ YOKE
- ⑫ FRONT COIL
- ⑬ COIL SHIM
- ⑭ FRAME BASE
- ⑮ TUBE VISE
- ⑯ FRAME UPRIGHT
- ⑰ COIL CORE
- ⑱ ARMATURE PIN
- ⑲ ARMATURE BAR
- ⑳ CONTACT POINT
- ㉑ FORWARD
- ㉒ BACK
- ㉓ UP
- ㉔ DOWN

*Bill Baker's*

# MILLION DOLLAR MACHINE

**IT'S A SPAULDING SUPREME THAT I BOUGHT NEW IN 1982.** I've always used it as a liner. In 1988 I replaced the frame with the frame from another Supreme that I had, but wasn't using. The newer frame has a swing-gate tube vise. The tube vise of the original frame had finally become unfixable. I didn't really change much on the machine after that for a long time. Occasionally I'd monkey around with the springs –and I worked on the tube vise, re-drilled and tapped it in the early 90's. Mostly the machine doesn't give me any trouble and I use it every day. In 1997, when we first developed the meter at Eikon, I completely rebuilt this machine...took it all apart–restyled the frame, stripped off all the chrome, re-did the wiring and heat-shrink. Worked on it for about a week–got it looking more or less how it does now, and got it running better than it ever had. In February of 2000, we put a prototype Tru-Spring™ armature bar and springs on this machine. That got changed to a production armature during the summer, and the machine hasn't been changed since. The Tru-Spring™ bar got the speed up to about 160, which I like better...before I couldn't get the speed over 150. With a tube and 3 needle liner it now runs about 135, which works pretty good for me. I mean, mostly I can follow a stencil, anyhow. I've been using this machine for almost 20 years and during that time I know I've outlined over a million dollars worth of tattooing with it.



|        |                   |
|--------|-------------------|
| name:  | CRAIG DRISCOLL    |
| place: | VANCOUVER, CANADA |
| exp:   | SINCE 1995        |



'95 Sharpz Line-o-graph

**Now a "working" machine is a lot different from a "running" machine. Without proper training and experience anyone will learn this the hard way, on former friends.**



Smash Back Jonesy

WHEN WE ASKED CRAIG DRISCOLL A.K.A. 5/2 TAT2 TO SEND US SOME PHOTOS AND SUPPORT TEXT OF THE MACHINES HE'S CURRENTLY RUNNING, WE WEREN'T REALLY READY FOR WHAT'S VISIBLE PAST THE A TO Z OF 5/2 TATTOOING. Craig has always been a careful machine builder with a neat and tidy color coordinated style. Still obviously meticulous, he's left the painted frames and matching wires back in the 90's. His machines have always run in a no-nonsense way. Now they've got that no-nonsense look. "The first machines I had were Supremes ordered from Spaulding and Rogers as a kit, unassembled. How hard could they be to put together? Once I got down to it I thought it was easy, once done, they worked. Now a "working" machine is a lot different from a "running" machine. Without proper training and experience anyone will learn this the hard way, on former friends." Craig's been setting up good running and good looking machines for himself, and a lot of other tattooers since 1997. Over the years he's developed some ideas and rules that he applies to all the machines he sets. First of all, no chrome. Next, no clip-cord, he switches things over to RCA plugs and he's gone as far as to completely remove the rear binding post and mount. There will be absolutely no glitter tape on the coils of a machine Craig set up. Lastly, but maybe most importantly,

he hand cuts the springs for any machine he's setting up. "My favorite machine is a Jim Dandy that was given to me for a tattoo. The guy hated the machine because he couldn't get it working properly. I gave it all the treatments, dechroming the frame, filed down the edges, rounding out the angles. I cut a toonie to mount the RCA plug on the spring shelf, cut 18 gauge stock for front and back springs bending them oh so much for the ideal gap and stroke. Got rid of the rear binding post, replaced all the screws and bolts with matte black hex screws, wires and coils were all fitted with heat shrink. I then tuned it up to working speed and threw it on the Eikon meter to do the final adjustments to the gap, filed to a point, meeting the front spring tip perfectly. She runs at 110 Hz, 40% duty cycle, 9.5 volts with no load, and looks good. Gotta look good too!" Sure, Craig makes it look easy, but he says "making a good looking machine is easy. But don't forget to always be looking good while doing it the right way."

## READERS' MACHINES

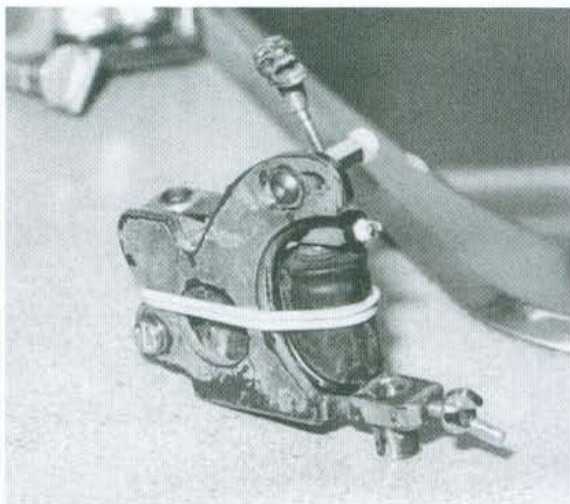


|        |                  |
|--------|------------------|
| name:  | KEITH STEWART    |
| place: | MONTREAL, CANADA |
| exp:   | SINCE 1976       |

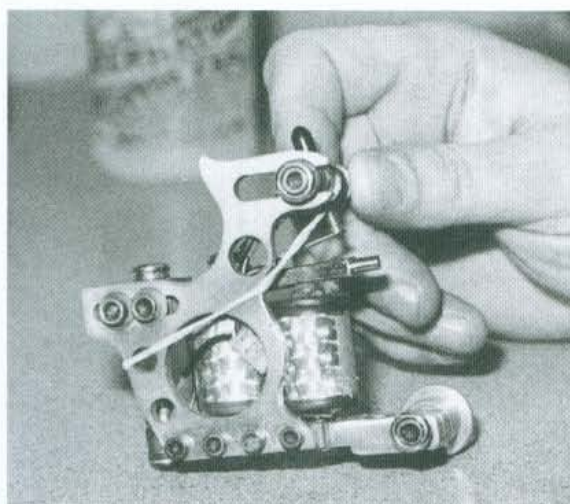
### AFTER TWENTY-FIVE YEARS OF TATTOOING IN MONTREAL, KEITH STEWART KNOWS WHERE HIS PRIORITIES LIE.

He doesn't spend his time working on machines—he spends his time doing tattoos. After all, that's what tattooers get paid for, isn't it? "I don't work on my own machines. I buy the

machine—it works good—I don't touch it." Almost no one who tattooed through the early nineties got away without going to a few conventions and buying at least one Mickey Sharpz machine. Over the years, Keith has bought a lot of machines. "That original Mickey Sharpz I bought at a convention in 1992. I did a lot of tattooing with that machine, and not just out-line, I'd color them in with it, too." For the past three or four years the only machines Keith has been using have been hand-built by fellow Canadian old-timer, Mack Bregg. Keith can't say enough good things about Mack's machines. "A lot of the new companies have picked up on a lot of his stuff, copied the things that Mack is doing here." The Mack machines are of the super-adjustable, super-machined variety. Lots of tricky mill-work and "O" rings. A far cry from the first machine Keith bought from an ad in Easyriders Magazine in 1976. A lot of people tattooing today weren't even born then. "I usually have about nineteen machines—I keep the ones I really like, but I've sold a few, or I give them as gifts."



High-Mileage Mickey Sharpz



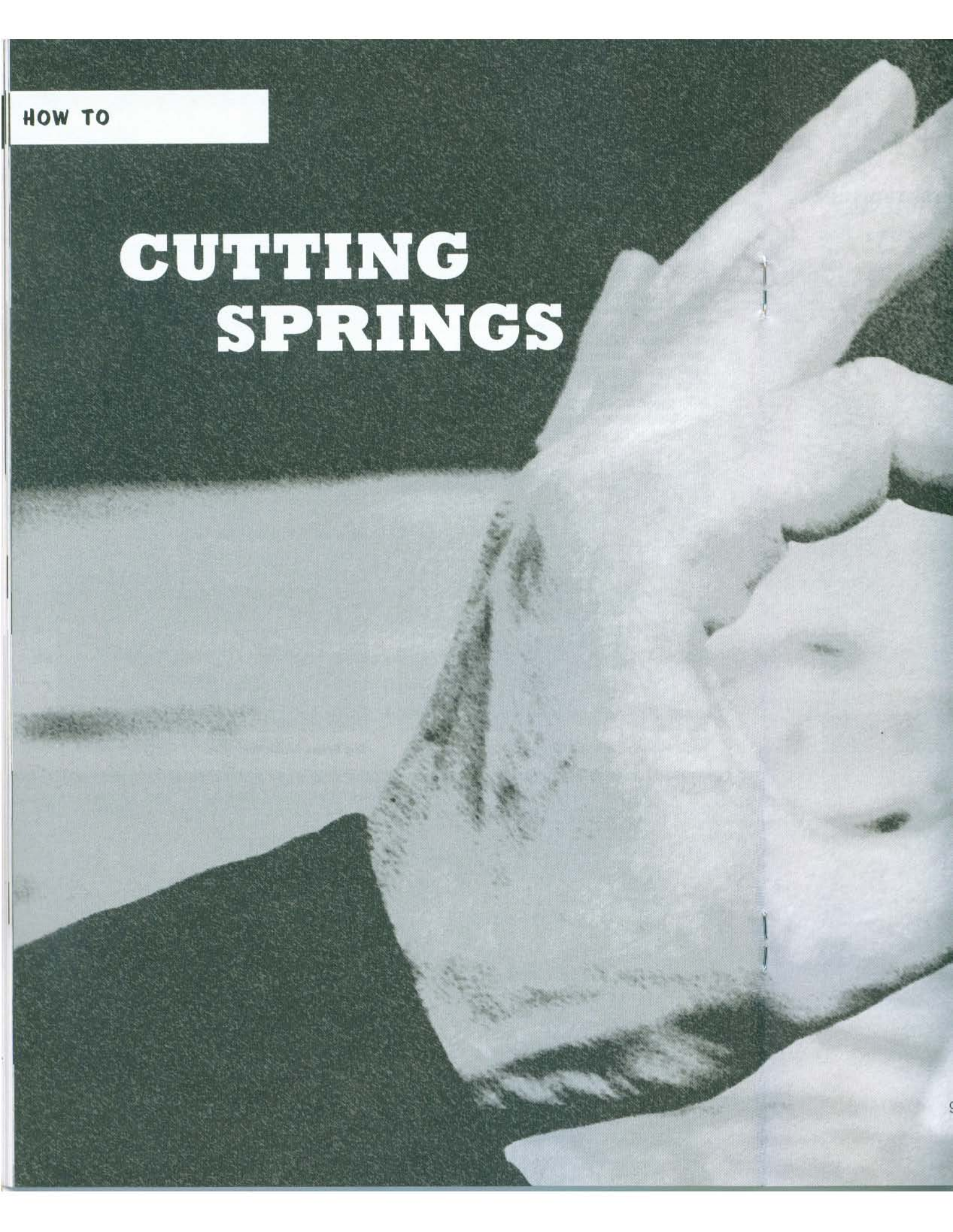
Big Brass Mack Machine

**EIGHT IS ENOUGH (top row) '92 Mickey Sharpz, a Doc Forbes, '96 Mickey Sharpz, another Doc Forbes machine (bottom) four different Mack machines**



HOW TO

# CUTTING SPRINGS





**When I first started tattooing I thought cutting springs had to be the stupidest, old-style thing going. We did make some springs out of blue strapping steel.**

**Instead of making my machine run better, those hand-made springs generally made it run worse. So I'd put on a new spring that I'd bought from some supply company, and hope for the best.**

**The best being that my machine wouldn't run much worse than it had before I started monkeying around with it.**

There were two major problems with what we were doing back then. We hadn't built the first meter yet, so I couldn't read the speed of my machine. I couldn't tell how most of the things I was doing to my machine affected it. I

was guessing what I was doing. Worse than that, we really only had a couple of unknown spring gauges to work with. Once we started using feeler gauge stock to make springs, we could create an exact spring force. If we needed more force, we would cut another spring out of heavier gauge stock. If we needed less force, we'd make a spring out of lighter gauge stock.

You need to choose the right combination of front and back springs to get a machine running right. If you follow some basic rules, you will be able to change how your machine runs. More importantly, you will understand how to get your machine to run the way you want it to.

### Tools and materials needed to make and install springs

**FEELER GAUGE STOCK** *various gauges*

**METAL SHEARS** *for cutting feeler gauge stock*

**PUNCH SET** *for punching holes in feeler gauge stock*

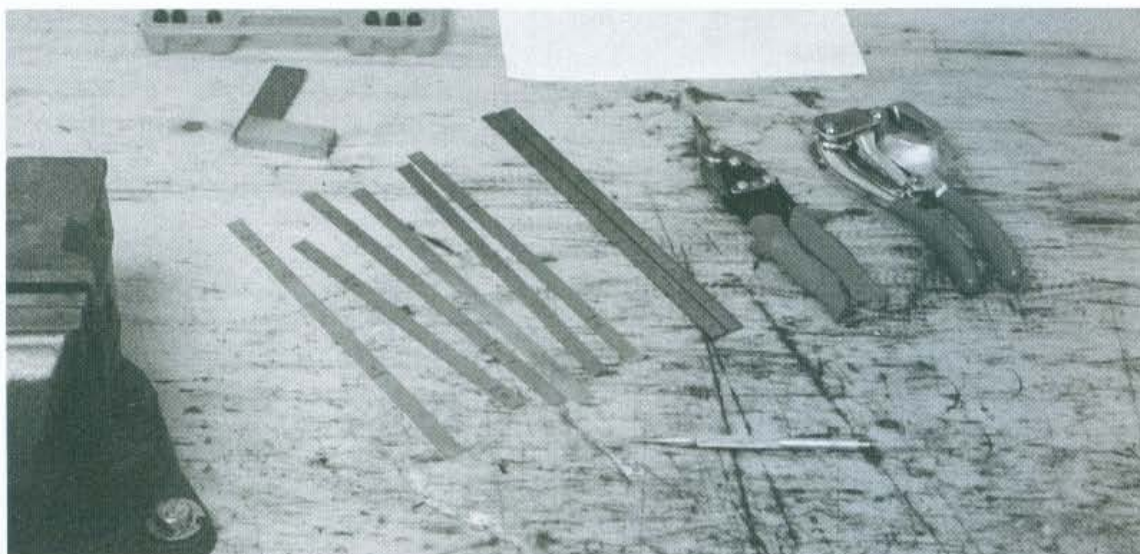
**RULER AND SCRIBE** *for marking measurements on feeler gauge stock*

**HEX KEY SET, SCREWDRIVER**

*for tightening and loosening screws that mount springs on the machine*

**VICE** *for bending springs*

**METER** *to fine tune machine speed and compare one spring to another*



### Tattoo Machine Spring Basics

**The SPRINGS on a machine control:**

- VOLTAGE the machine requires
- SPEED of the machine
- LENGTH of stroke on the machine

**FRONT SPRING determines machine speed.**

- HARDER FRONT SPRING. Machine will run faster.
- SOFTER FRONT SPRING. Machine will run slower.

**BACK SPRING provides the force that puts compression on the front spring.**

**SPRING FORCE is determined by these factors:**

- LENGTH OF SPRING. Longer spring acts softer, shorter spring acts harder.
- WIDTH OF SPRING. Wider spring acts harder, narrower spring acts softer.
- GAUGE OF SPRING. Heavier gauge is harder, lighter gauge is softer.
- ANGLE OF DEFLECTION. Greater angle of deflection on back spring creates more force.

In most cases the springs on a machine are the correct length.

Back spring length is critical. If it is too short or too long the needle bar will not run down the center of the tube.

Make measurements from machine before removing old springs.

1. Measure the distance from the center of the screw on the armature bar, to the center of the screw on the spring shelf, or saddle of the frame.
2. Using the diagram or original spring as a guide, mark spring stock with a scribe. Showing overall length, placement of holes to be punched, and where the spring will be bent. It is very important to mark the gauge of the spring stock somewhere on the spring, for future reference.

3. Using shears cut spring stock to correct length.

For front spring—once length, bend, hole placement, and gauge for front spring have been marked, cut front spring to length.

4. Mark spring stock with a scribe showing taper of front spring. Mark this on both sides of the spring stock.

5. Taper must be cut from narrow end of the spring, towards the back of the spring.

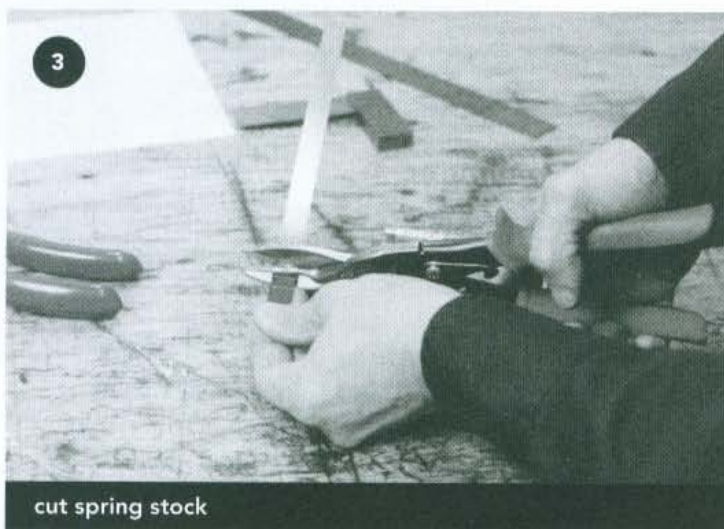
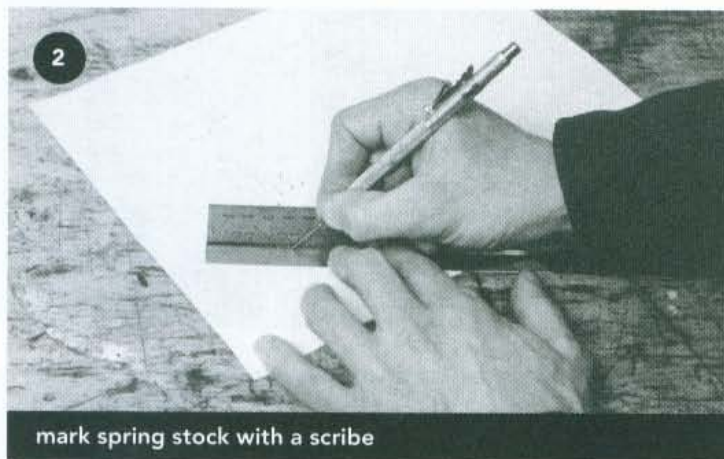
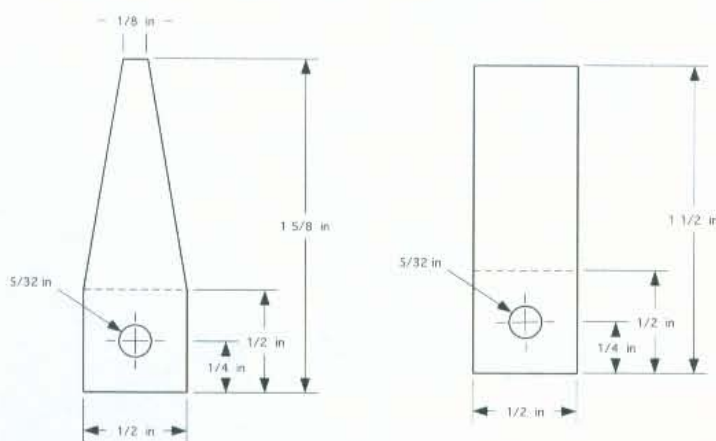
6. Cut one side, then turn spring over to cut the other.

7. Punch holes in spring stock where marked.

8. Put spring in vise, lining up bend mark with the jaws of the vise.

9. Slowly, with even pressure bend spring. Check angle of bend with diagram or original spring.

Install new springs onto machine, with front spring over back spring, on armature bar.



## HOW TO



mark spring stock with a scribe



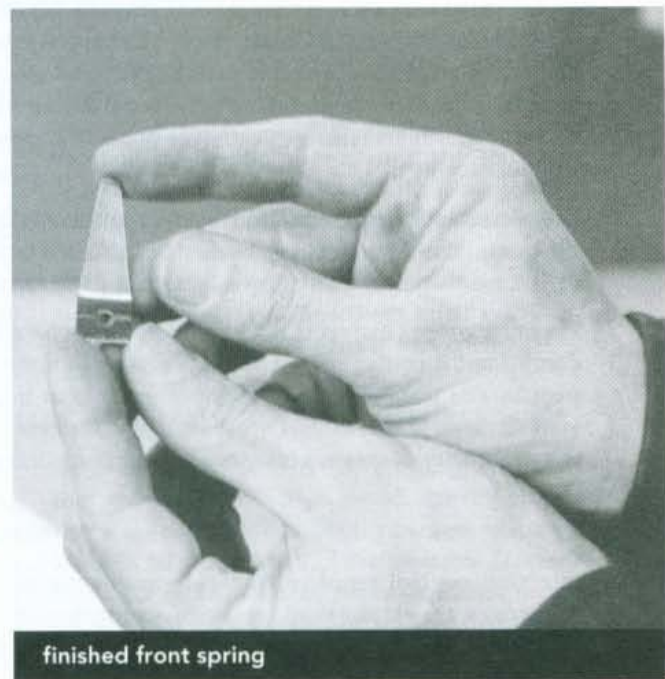
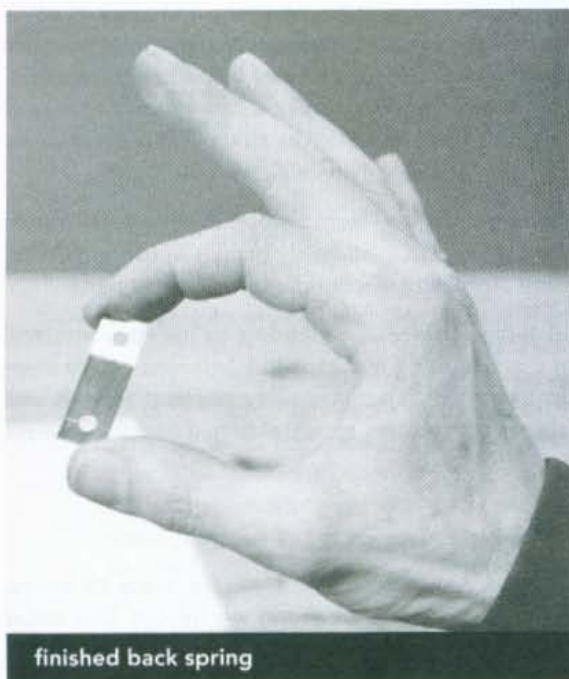
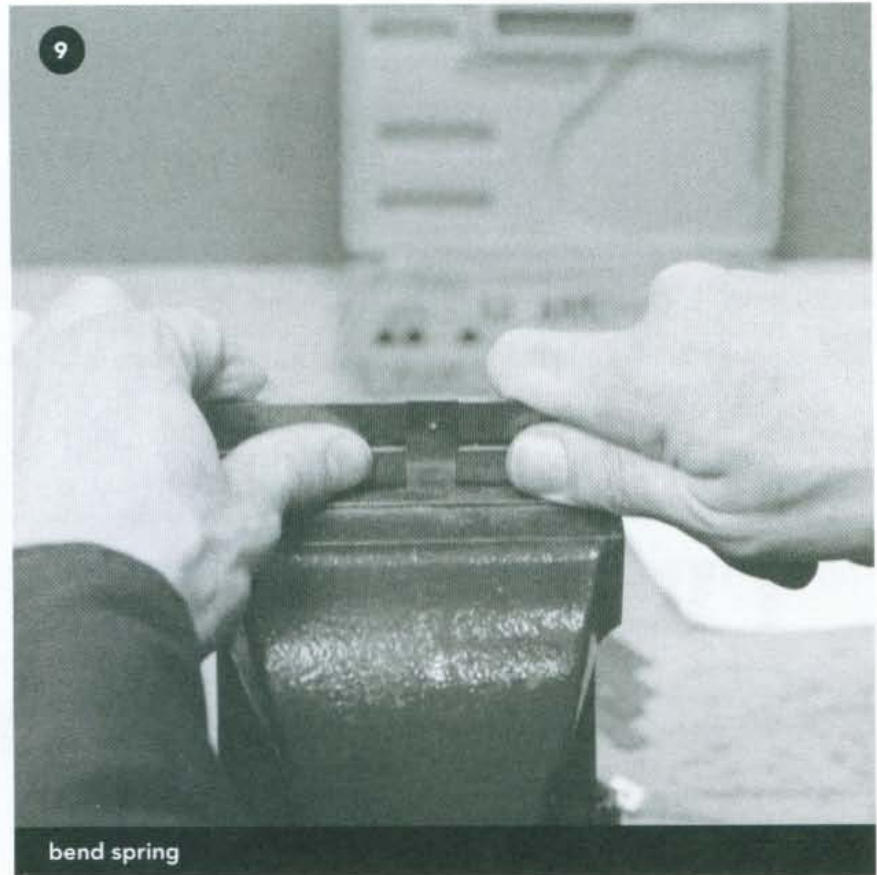
cut taper



turn spring over



punch holes





# **PREVENTION OF CROSS-CONTAMINATION IN TATTOOING**

**TATTOOING CAN BE A SERIOUS HEALTH RISK TO THE TATTOOER, THE CLIENT, AS WELL AS EVERY PERSON WHO ENTERS A TATTOO SHOP.** Tattooists have an ethical, if not legal responsibility to see that proper procedures are in place that ensure exposure to health risks are minimized. Many individuals carry blood borne infections, without displaying recognizable symptoms of illness. Any tattoo shop is open to contact with a variety of viral and bacterial infections. The application of protective, preventive procedures is needed at all times, for every client, without exception.

Cross-contamination refers to the unintentional transmission of infection from person to object, then from the contaminated object to another person. In a tattoo shop, this most commonly occurs in the work area, or is a result of improper procedure during the cleaning and sterilizing of contaminated instruments.

Hepatitis viruses can remain active on a surface for a period of days to weeks, depending on the environmental conditions. A contaminated object, surface, or instrument can become a common link between two or more people, and transmission of infection can occur from client to client. The possibility of client to staff, and staff to client transmission must also be considered. If correct procedures are established and maintained, the possibility of disease transmission can be minimized.

## **XX ZONES XX**

Infection control requires that a shop environment is considered in terms of separate areas or zones. The zones are established by usage—reception area, work area, cleaning area, and washroom. The zones should be designated as clean or contaminated. The integrity of these zones, once established, must not be compromised.

## **TATTOOISTS HAVE AN ETHICAL, IF NOT LEGAL RESPONSIBILITY TO SEE THAT PROPER PROCEDURES ARE IN PLACE THAT ENSURE EXPOSURE TO HEALTH RISKS ARE MINIMIZED.**

A contaminated zone is an area in which there has been any exposure of bodily fluids, especially blood. Overspray created during the tattooing procedure may contain microorganisms which can settle and survive on surfaces, establishing an area as contaminated. Any person entering an area which is potentially contaminated must be aware of this fact or access to this area should be restricted.

An area in which any possible exposure to contaminants has been eliminated is a clean zone, this area can be maintained through disinfection and strict adherence to procedure.

Contaminated zones in a shop should be contained, and separated as much as possible from the rest of the shop. This area should not be accessible to anyone, except staff and the client being tattooed. Any person with an uncovered, fresh tattoo, should not be allowed outside the designated contaminated zone. The tattooist should never leave the work area with contaminated gloves on.

The reception area of a shop should be established and maintained as a clean zone.

The area where instruments are cleaned prior to sterilization must be considered a contaminated area. There should be no public access to this area.

The area in which tattooing is done should be considered contaminated as soon as the session begins. Before the next client enters this area it must be returned to a safe, clean condition. The preparation of the tattooing area is disinfection after the previous appointment. During the tattooing procedure any surface or object in the room that the tattooing is being done in may become contaminated. The tattooing area must be easily cleaned. Waste receptacles should have a large opening without a lid. Plastic bags should be a heavy gauge which will not easily

tear or puncture. Materials that will be needed during the tattooing procedure should be laid out for each session. They should be easily accessible to avoid unnecessary hand contact and consequent contamination of counter surfaces, drawer handles, and cabinet knobs. A disposable cup of water should be used to rinse the machine tube during the procedure, as sinks are problematic due to the difficulty in re-establishing cleanliness.

### **XX DISPOSABLE ITEMS XX**

Disposable items should be used wherever possible. Disposable caps should be used for pigment. Disposable razors should be used once only, then discarded. Items that will be re-used, such as tubes and needle bars, should be made of stainless steel and sterilized after each use.

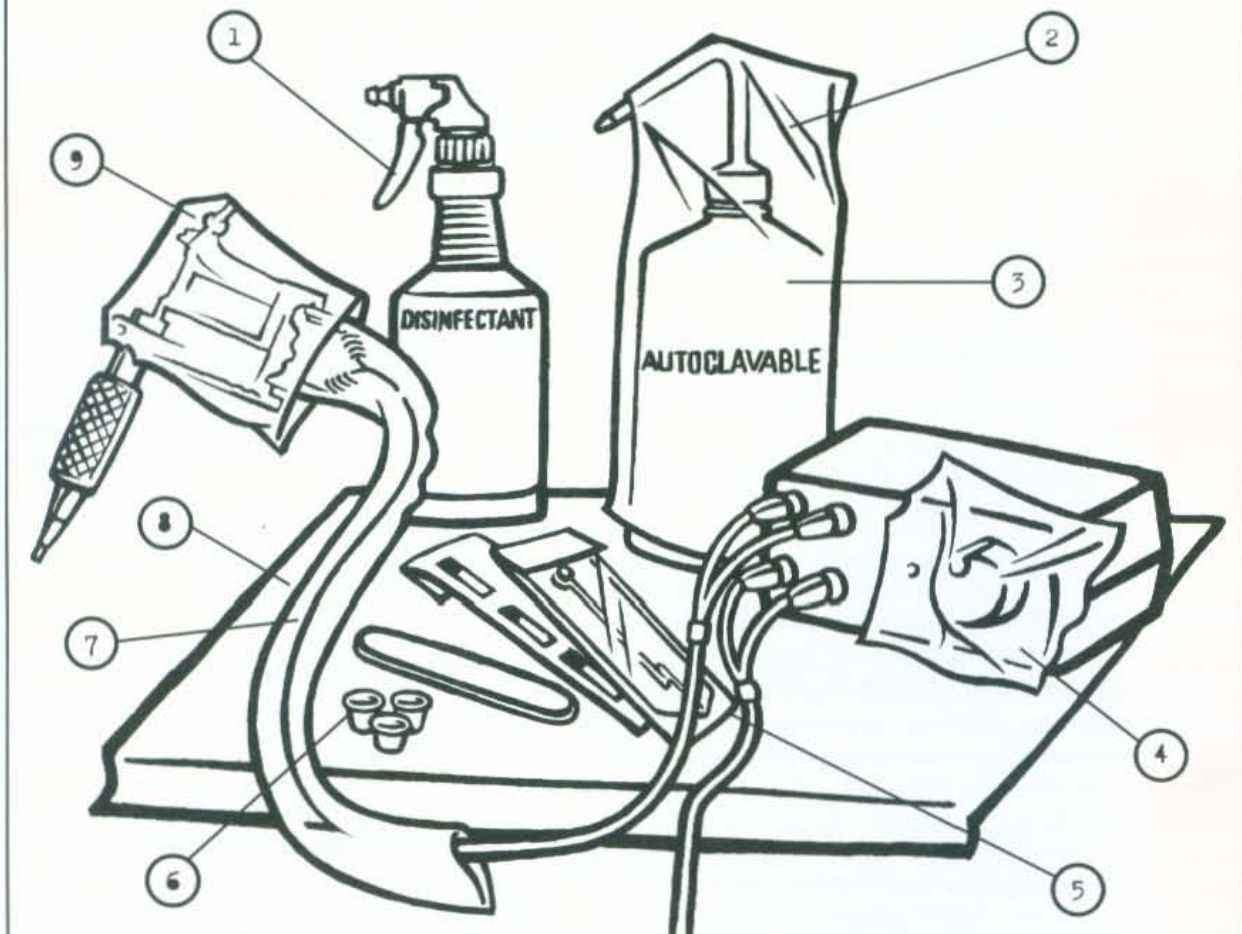
### **XX NON-DISPOSABLE ITEMS XX**

Items that are not disposable, and cannot be sterilized must be covered with a disposable plastic barrier, to prevent contamination from reaching surfaces. Anything that will be touched by the tattooer during the tattooing procedure must be covered with plastic bags, such as, spray bottles, clip cords, and tattoo machines. Plastic backed napkins should be used to create a disposable work surface. When removing plastic barriers, care must be taken not to contaminate the area it was covering.

### **XX SURFACES AND OBJECTS XX**

Objects and surfaces in the tattooing work area that are either not disposed of, sterilized after one use, or have not been covered, must be brought to a high level of disinfection. Efficient chemical disinfection requires exposure to the disinfectant for a significant amount of time, for many products it is as much as twenty minutes.

1. Surface Disinfectant
2. Wash Bottle Bag
3. Wash Bottle. Reduces aerosol associated with spray bottle.
4. 1/2 Tack Surface Barrier. For any surface.
5. Sterilization Pouch with indicator. Dated with one instrument in each pouch.
6. Disposable Pigment Cap
7. Clipcord Bag
8. Dental Bib. Disposable surface barrier.
9. Machine Bag.



This is difficult in a busy shop environment, where clients are seen consecutively in the same work area. Extensive use of disposable plastic barriers, such as dental bibs, will reduce the need for chemical disinfection of the work area between clients. Counters and tabletops that have not been covered have been exposed to airborne particles which may contain contaminants. These areas must be wiped down with detergent germicide, and left to air dry between appointments.

The task of choosing an appropriate product for cleaning and disinfection of items such as tables, chairs, counter tops and floors can be very confusing. Some time must be spent becoming knowledgeable about the available products, and what is needed for the shop.

"Five specific questions should be asked about any product under consideration:

- What are the recommended uses of the product?
- What is the active antimicrobial ingredient?
- How is the product used?
- Will the product damage surfaces or equipment?
- What is the product's toxicity?"<sup>1</sup>

Ask for documentation on products. If a sales representative is unable to provide technical information about their product, speak to someone who can. If the supplier seems incapable of providing substantial data, look elsewhere for another product.



## **IF CORRECT PROCEDURES ARE ESTABLISHED AND MAINTAINED, THE POSSIBILITY OF DISEASE TRANSMISSION CAN BE MINIMIZED.**

New products for cleaning and disinfection appear on the market constantly. However, the active ingredient used in these products is generally the same as contained in many older products. It should be an active antimicrobial agent. If you are uncertain about a disinfection product, or process, consult the municipal health department. Health department personnel have access to information that makes them a valuable source of assistance. They should not be regarded with fear or suspicion.

When a tattooing session is completed, the instruments that are to be sterilized must be taken to an area designated for cleaning contaminated instruments prior to sterilization. Thorough pre-cleaning to physically remove all matter is mandatory prior to sterilization. As it is nearly impossible to clean the small spaces between needles in multiple needle configurations, re-use is strongly discouraged. Any object to be sterilized must be physically clean prior to sterilization. Any particles left on the instruments can impair the sterilization process.

Ultrasonic cleaning is not a substitute for sterilization. It should be considered as a cleaning process only. Ultrasonic cleaning is preferred over manual cleaning, for it has more efficient penetration into the small spaces of tubes. A major concern is the risk of nicks or cuts by anyone scrubbing the instruments by hand, as well as exposure to over-spray and splatter. These should be considered as common potentials for cross-contamination.

Items should be packaged and sealed in autoclave bags, and dated prior to sterilization. Care should be taken that the packages are completely dry before they are stored. "The maximum time a sterilized pack can be stored is debatable. Paper/plastic peel pouches are said to be safe for six to twelve months. Contamination is event-related, not time-related. The conditions of storage and the amount of handling to which the packs are subjected are more important determinants of contamination. Sterile packs should be kept on closed shelves away from moisture or possible contamination, and handled as little as possible prior to use."<sup>2</sup>

## **HAND WASHING REMAINS ONE OF THE SIMPLEST, AND MOST IMPORTANT MEANS OF PREVENTING CROSS-CONTAMINATION.**

The use of gloves is not a substitute for hand washing. Hand washing remains one of the simplest, and most important means of preventing cross-contamination. Hands should be washed with soap and water as soon as gloves are removed.

### **×× MEANS OF STERILIZATION ××**

Effective methods for sterilization are relatively limited. There are five methods commonly used to sterilize instruments: Autoclaves (steam under pressure), Dry Heat Sterilizers (hot air oven), Chemical Sterilization (Glutaraldehyde), Chemical Vapour, and Ethylene Oxide Gas.

The most suitable sterilization system is determined by the tolerances of the instruments being sterilized. An autoclave remains the easiest and most appropriate method of sterilization available for tattooing because the instruments being sterilized can withstand high temperature and steam under pressure.

An autoclave accomplishes sterilization in much less time than a dry heat sterilizer can. Sterilization of unwrapped instruments takes 20 minutes at 126°C (260°F), and 30 minutes at 126°C (260°F) for wrapped instruments.<sup>3</sup> An autoclave raises the boiling point of water to 121°C (250°F) by increasing the air pressure by one atmosphere (15 psi or 103.4 KPA).<sup>4</sup> Autoclaves use distilled water to prevent scale deposition on instruments.

Dry heat sterilization is used mainly for materials that cannot be sterilized safely with steam under pressure, either because of the pressure or the steam. Dry heat would take one hour at 170°C (340°F), or two hours at 160°C (320°F).<sup>5</sup> Timing must start when the entire contents of the sterilizer has reached the peak temperature needed for that particular load. Some wrapping materials are intolerant of dry heat, which complicates storage of dry heat processed instruments.

Chemical sterilization has many limitations, and should only be used for instruments that are intolerant of heat. Glutaraldehyde products are the only chemicals that are sufficiently sporicidal to accomplish sterilization. Exposure time is long (6 - 10 hours). During this period of immersion, no other instruments may be added or removed from the bath, as this interrupts the process. Because of toxicity, glutaraldehyde baths must be covered and left in areas with good ventilation. Glutaraldehyde must be thoroughly rinsed off instruments with sterile water before they are used.

Chemical vapour sterilization uses a combination of alcohols, formaldehyde, ketone, water and acetone, heated under pressure to produce a sterilant gas. Temperatures used are 260°F - 270°F (126°C - 132°C) at 20 to 40 pounds pressure. It requires 20 minutes at temperature, and adequate ventilation is required.

Ethylene Oxide Vapour in Chamber - time duration of cycle varies by temperature and concentration of gas. Relatively low operating temperature means ethylene oxide sterilization is suitable for relatively heat-sensitive items. Adequate ventilation is required and exhaust of ventilation must be controlled. An indicator strip or tape should be included on each sterilizer bag. Most sterilizing bags or pouches have a process indicator on them. A process indicator is printed with an ink that changes colour with exposure to

heat, steam or chemical vapour. A colour change indicates that a pouch has been processed, but it is not proof of proper sterilization.

A sterilizer should be tested at least monthly to ensure that it is functioning properly. Biological monitors or spore tests are small strips of paper, or ampules containing living non-pathogenic resistant spores. The biological monitors are placed in hard to reach areas of the sterilizer, and then cultured. If the spores have been sterilized they will not germinate. Some biological monitors must be returned to the company for culturing, and some come with a colour indicator that indicates proper sterilization.

### XX SHARPS DISPOSAL XX

Needle configurations should be discarded directly into a sharps container. "Sharps containers must be disposed of by one of the following methods:

- removed by a licensed biomedical waste management company.
- taken to a hospital or laboratory which will ensure proper disposal.
- autoclaved and disposed of with general wastes." <sup>6</sup>

### XX WASTE DISPOSAL XX

The disposal of potentially contaminated waste is generally legislated municipally. Local health departments can provide information about a tattooist's responsibility as it pertains to waste disposal.

Garbage containers should be lined with heavy gauge garbage bags. Never allow bags to overfill. Do not place hard or heavy objects in bags which could cause potential tears or punctures. Keep waste from contaminated areas out of clean areas. In all areas bags should be sealed, then promptly removed. Waste collection receptacles and dumpsters should be kept locked awaiting collection.

Although waste produced during the tattooing process should be considered contaminated, it does not fall within the scope of regulated hazardous waste. The Bloodborne Pathogens Standard uses the term, "regulated waste," to refer to the following categories of waste which require special handling at a minimum;

- "liquid or semi-liquid blood or other potentially infectious materials;
- items contaminated with blood or other potentially infectious material and which would release these substances in a liquid or semi-liquid state if compressed;
- items that are caked with dried blood or other potentially infectious material and are capable of releasing these materials during handling;
- contaminated sharps; and
- pathological and microbiological wastes containing blood or other potentially infectious material." <sup>7</sup>

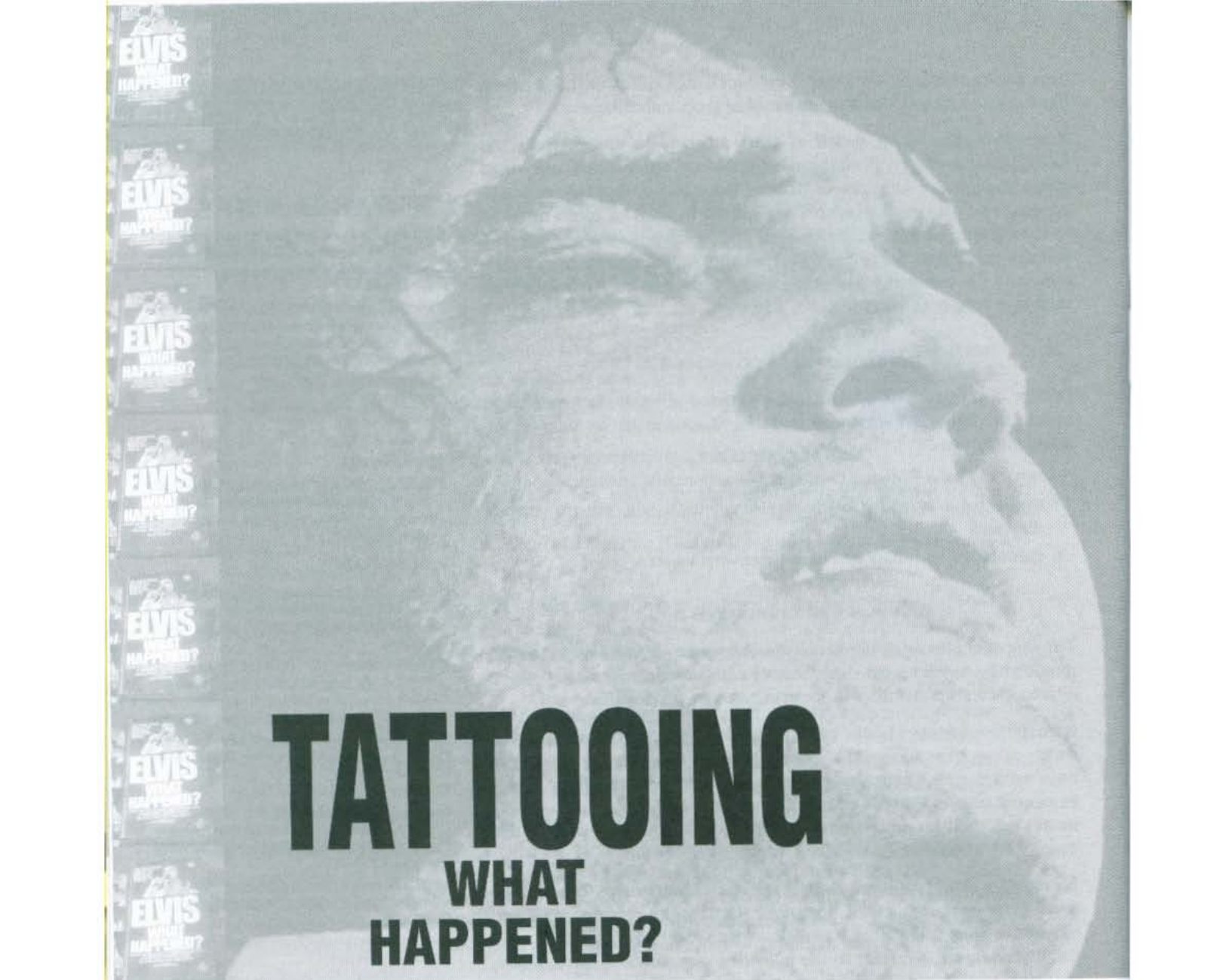
To ensure that everyone involved in the tattooing process is safe from exposure to infection through cross-contamination, it is important to follow proper methods of cleaning, disinfection and sterilization. Adequate levels of cleaning, disinfection, and sterilization can be achieved quite efficiently and cost-effectively.

### ENDNOTES

- 1 Elizabeth Henderson, PhD, and Thomas Louie, MD, FRCPC, "Sterilization and Disinfection: Helpful Hints in Office Practice." *The Canadian Journal of CME*, (1993), p. 80.
- 2 Douglas C. Drummond, MD, CCFP, "The Prevention of Cross Infection in the Physician's Office." Committee on Office Medical Practice Assessment, College of Physicians and Surgeons of British Columbia. (1992), p. 9.
- 3 Drummond, p. 8.
- 4 Drummond, p. 5.
- 5 Drummond, p. 8.
- 6 Drummond, p. 16.
- 7 Bloodborne Pathogens Resource Package, March 1993, Division of Occupational Safety & Health, General Industry Safety Orders, Section 5193, Title 8, California Code of Regulations, p. 8.

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# TATTOOING

## WHAT HAPPENED?

**LET ME EXPLAIN SOMETHING. NOT ALL SCIENCE IS GOOD SCIENCE. IN FACT, NOT EVERYTHING THAT IS PRESENTED AS SCIENCE, IS SCIENCE AT ALL.** In any attempt to learn things, a systematic method of study is required. Initially a hypothesis is made, and it will be accepted to be true, until it is proven untrue. You see, the idea isn't to prove things are true...it is to prove things are not true. In any case of trying to prove things, accurate measurements must be made. A world without measurements would be a world of chaos..

Imagine the police pulling you over, stating they were going to give you a ticket because you seemed like you were probably speeding. You wouldn't accept that. But tattooing has been functioning on a set of mechanical rules that are absolute guess work. There's even an entire list of non-sensical terms that describe nothing, that seem to be accepted by the trade. What does it mean to "burn a tune" into your machine? What exactly is a "sweet spot"? What kind of yokels are you? There is always an amount of voltage, that in conjunction with a certain contact point size, will cause the machine to run smoothly—and guess what? That's why the contact point on the machine and the voltage on the power supply, are adjustable – so you can do that. Don't tell me about the sweet spot.

I can see you all, just sitting there, drooling, adjusting the point gap, then adjusting the voltage, a little up, a little down, mostly down though, 'cause them low volts is good, and all the time imagining you're working on your machine, just like the old

## HISTORY OF NEEDLEMAKING

time machine builders. Well you're not. First off, you're not working on your machine, and secondly if you were like the old time machine builders you'd probably be drunk, but for sure you'd be a broke loser in a trailer park some place. And if you're O.K. with that, good—but don't make it all out to be something that it wasn't. I'm not saying old time tattoo machine mechanics should be criticized as people—but to admire how they did things...to use their terminology...come on—they had no idea what they were doing. Case in point, the cut-back machine style.

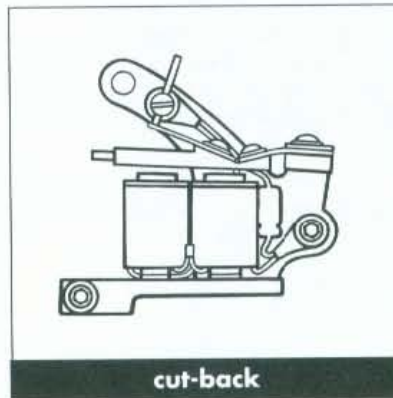
Although I can admire the ingenuity that it took to develop the cut-back, I can't believe it was accepted as a viable solution. Really, it should have been a stepping stone to a simple, more efficient solution. Basically, the major old timer problem was spring stock. They very rarely would use a variety of spring stock—they'd find something they believed was good and stick with it. Now it's pretty difficult to make a machine run faster or slower without changing springs—but they managed to do that with the cut back. By moving the contact points back on the front spring, the spring will act hard. Imagine a long piece of wood, a 2" x 4", maybe eight feet long, it will bend, or flex. Now, cut a foot off that same piece—same wood, same thickness, but it won't flex. The springs on a tattoo machine are the same—if the spring is long, it will flex a lot, if the spring is short, it won't. Not only is the front spring on a cut-back short, but it is usually pretty wide as well, making it even stiffer. This is going to give you a very short closed contact time on that machine. That is to say when the contact points on the machine touch there will be no flex in the front spring, so the contact points will open again very quickly. Now if that front spring was very, very soft the contact points would touch, then flex up, then slowly flex down, and finally open. That's why a hard front spring will make a machine run faster and a soft front spring will make a machine run slower.

So to take a machine and alter it into a cut-back style means cutting and filing and moving that top binding post as far back as possible so that the contact point will be as far back as possible on the front spring. Now, you've got to imagine it'd take some half blind old goomer quite a while to do that, with his old file and a drill—but at least it would give him something to do. But just cutting a heavier gauge of front spring would have accomplished the exact same thing. If you're going to admire the old time machine builders, go ahead—but keep it in context. The fact that any of them would run a cut-back liner shows they were quick to determine a problem solved, when quite likely a simpler solution would have been found if they had just kept working at things in a scientific manner.

Anyhow, they had no way of measuring what they were doing with their equipment, so they could never prove or disprove anything. That was just the way they did things.



conventional



cut-back

The pointing of needles on high-speed power-driven sandstones was introduced about 1780. John Mills, who took over the converted Ipsley Mill in 1760, was probably experimenting with the idea as early as 1765, when he was charged threepence for a 'thing for the mill', and in 1766 for warps and stones, and again in 1767 for seven new pointing stones, warps and pulleys. Needles were almost certainly being pointed by dry grinding in 1780. This 'new' process was almost certainly similar to the one developed by the London needlemakers a hundred years earlier, and just as deadly. The first stones used were pierced with a square hole and fitted tightly on to a square shaft. This was accepted practice for edge grinders at that time, but it was found that at the high speeds required to obtain a good point the stones tended to crack in the corners of the holes under centrifugal force and break-up, causing serious injuries and sometimes death. Disturbing as this was, it was not the worst aspect. The pointers worked in semi-darkness in order to see the points forming by the light of their own sparks. The whole time they were enveloped in clouds of dust. It was found impossible for young men to become pointers until they had matured. The life of a pointer was considered to be about seven years, few surviving to see their thirtieth birthday. They were well paid and refused any improvements in their working conditions for fear that their salary would be reduced. When S. Thomas and Son introduced J. C. Chambers' fan into British mills the pointers went on strike for twelve months. Ultimately a much greater threat was posed by Colin Banks' pointing machine. The pointers purchased the first one from him and ceremoniously smashed it up on the Redditch Church Green in 1854.

Colin Banks used the money to go to Aachen, where he sold his invention to the needlemaker Schleicher of Schonthal and set himself up with the proceeds in Iserlohn, selling out to Hermann Joseph Neuss in 1860. He then returned home and built his own factory in Redditch.

# WHAT'S YOUR

**Q: One end of my clipcord is red, the other is black. Is this for positive and negative? If so, what's positive and negative on my machine?**

A: There is no positive or negative on a tattoo machine. There is a positive and negative on most, but not all, capacitors. The negative lead on the capacitor will be indicated, unless the capacitor is bipolar, in which case it does not matter which way the clipcord is. The draw back with bipolar or non-polarized capacitors is they have a much shorter life than polarized capacitors. The negative (black) end of the clipcord should always go to the connection on the machine closest to the negative end of the capacitor. Generally in electronics the ground, or negative, goes directly to the frame. On a tattoo machine this is generally

**If you're trying to save money, don't save it on needles, it's only a few cents and will ultimately affect your work.**

the top connection, at the spring saddle. The lower binding post would be the positive, because it is insulated but you'll find as many machines with the negative at the bottom, as at the top—so check the capacitor.

**Q: I know I should be covering my machines with a plastic bag, but it seems like that will cause my machines to overheat. Is that possible?**

A: First of all, you're right. You should be bagging your machines. If you transmit a disease from one client to another because you are ignorant of proper procedure, that would be a terrible thing. But if you knew better, and just didn't follow proper procedure for whatever reason, how could you live with yourself? Secondly, bagging your machine will not cause machine overheating.

**Q: What's the difference between carbon steel needles and stainless steel needles? I've also been hearing about carbon plated needles—what are they?**

A: The quality, or usability of a needle for tattooing cannot be judged solely by what the needle is made of. Certainly, stainless steel needles are the only needles that should be used for tattooing—but not all stainless steel needles are going to work well for tattooing. The profile and diameter of the needle will determine whether or not a needle will work well for tattooing. Carbon steel is a softer metal than stainless steel and consequently easier to grind. So, a less expensive material that's easier to manufacture ends up being a less expensive product. But not one that should be used for tattooing. Carbon steel has a tendency to rust very quickly—and would

be constantly exposed to liquids during the tattooing process. Carbon plated needles are generally nickel or chrome plating over a carbon steel needle—not some kind of carbon plating on a needle. Very inexpensive, very low quality. No plated needle should ever be used to tattoo. The process of tattooing causes some wear on the needles. As the plating starts to wear, it chips and separates from the needles. Stainless steel is a more expensive product, and very difficult to grind, especially at the diameters and to the tolerances required to make a good needle for tattooing. Its high cost would be its only drawback. If you're trying to save money, don't save it on needles, it's only a few cents and will ultimately affect your work.

**Q: Lately my machines have been losing power and sputter a bit when I'm working. I've only had my power supply for a year, and paid a lot for it. Could it be wearing out already?**

A: No the problem is almost certainly not your power supply. Almost every time it's your clipcord. The wire will break inside the rubber coating, so it won't be visible to your eyes, and it won't just break one day, it slowly breaks down causing nothing but trouble. It seems like it's your machine or the power supply—but really it's just the clipcord. They don't last forever—I'd guess you got a new clipcord when you got a new power supply—and about a year, for a busy tattooer is about how long a clipcord will last. Always have a spare clipcord on hand, this is the first thing to check when you have any mechanical problems—and it's usually the culprit.

**Q: Some of the guys I work with are absolutely anal about cleaning their tubes—but they're going to get autoclaved anyway, so what's the big deal?**

A: Autoclaving your equipment is not the same as cleaning—DO NOT KID YOURSELF! Things must be physically clean before they are sterilized. And I mean perfectly clean. Let's imagine a tube that's been used to tattoo—it's a bit dirty but you rinse it off, scrub it, and it seems pretty clean. You bag it, and autoclave it. Later that week you set up with that tube again—it's sterilized—it looks clean—but if there was a bit of dried pigment inside the tube in some small corner that didn't get cleaned away, it's still there. Once you start working that bit of dried pigment dissolves. Now it's gone—dissolved into the pigment you're using today. The problem is the corner of the tube that was covered by that microscopic bit of pigment is now exposed—it was not cleaned because it had pigment on it. It also was not sterilized because it had pigment on it. This is a very serious issue that must never be taken lightly. Know your procedure, review your procedure, and never take short cuts with your procedure.

# PROBLEM?

YOUR TECHNICAL DIFFICULTIES RESOLVED

ASK ME  
SOMETHING

**Q:** I'm looking at new power supplies. I've noticed some are 120 volt and some are 220 volt. Is there any advantage to the higher voltage power supplies — will they deliver more power? Will I have to do any re-wiring in my shop to use a 220 volt power supply?

**A:** In North America we use 120 volts. That's the voltage in your normal electrical outlet. Not so in other parts of the world. All of Europe in fact uses 220 volts. The power supplies that are 220 volt will not give more power to your machine, they are designed to be used in other parts of the world—it's as simple as that.

**Q:** What do the different numbers mean on a capacitor?

**A:** There are two numbers listed on a capacitor. The first is the voltage rating that appears as a number followed by a capital 'V'. This is the maximum voltage the capacitor can take before it fails. Two common ratings are 25V and 35V. Generally a tattoo machine never runs above 12 volts so a 25 volt rating is lots. The second rating is the capacitance rated in micro Farads. This is the ratio of the quantity of electricity and the voltage. In other words, the capacity of a capacitor depends on the amount of electricity it will hold at a certain voltage. Two common sizes that work well for a tattoo machine are 22  $\mu$ F and 47  $\mu$ F. There are many different ratings available, but these two supply the right amount of energy for the way a tattoo machine runs.

**Q:** One of the guys I work with has a lab supply. He claims that his machine runs better on low amps. I have no idea what that means. Can I restrict the amps on my power supply?

**A:** No, you cannot, but you would not want to even if you could. By changing the setting on your power supply you are trying to change the strength of your magnets. The way to make an electromagnet stronger or weaker is to vary the amount of voltage. This is the most accurate way to control your machine. By reducing the amps, you are just increasing the resistance in the circuit, and choking back the amount of power that your machine can draw. By adjusting the voltage, you are actually setting the strength of your magnets, and your machine will draw the amount of amps that it needs. To do this you must make sure that you have a variable voltage power supply. One example of this is a lab supply, but they



Continued on p43

Continued from p37

are generally overkill for tattooing. There are a few power supplies that are designed for tattooing that are as stable as a lab supply, but are considerably less money, and are more compact.

**Q: Why is blue steel considered by some to be the best material for springs?**

A: I am not sure why many people believe this, I think it is because that was all that was used for a long time. Basically, it is blue because of the tempering process. It is made of carbon steel, and tempered (heat treated) to make it as hard as possible. The draw back is that generally it is of fairly low quality. It is used in applications that are not as critical as the setup of a tattoo machine. To setup a machine properly, you must be able to vary the force of your front and back springs. The most practical way to do this is to change the thickness of the spring. You could do it by changing the length, but this is not practical, because you could not line up your needle bar in your tube. Basically you want a wide selection of spring thickness, in a steel that is very consistent, because a difference of 0.001" in thickness can make a big difference to how the machine runs. MM

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